that the organisms were excreted by the intestinal wall. Although the experiments were by no means conclusive, Buchner supported the views of Emmerich. More recently the subject of excretion of bacteria by the stomach and intestine has been investigated by Hess (*The Archives of Internal Medicine,* November 15, 1910). Without going into the details of the experiments it may be stated that this observer shows that at least the bacillus prodigiosus may pass directly from the blood through the intestinal wall. This was found to take place in one hour when one platinum loop of culture was inoculated. In these experiments all other paths of access from the blood to the lumen of the intestine were excluded.

Whether or not the same thing holds good for the human subject cannot of course be stated, but as Hess says, it is interesting to consider whether the analogy is applicable, whether the wall of the intestine functionates as an excretory organ not only in toxic conditions such as uremia, but also in bacteremias such as typhoid fever, or sepsis, and whether some of the intestinal symptoms and lesions, manifesting themselves in these states, are brought about by what may be termed a mural excretion. The whole question opens up an interesting field of speculation for the clinician, and offers alluring material for physiologist and pathologist alike.

COUNCIL MEETING.

The fifty-third meeting of the Council of the Medical Society of the State of California was held at noon on the 15th of December, 1910. There were present Drs. Kenyon, Aiken, Mays, Ewer, Ryfkogel, Grosse, Edwards, Parkinson and Jones.

The Secretary presented a statement of the financial condition of the Society, showing that there was more than sufficient cash on hand to pay all current bills and take up all outstanding notes, leaving a balance in the treasury. It was then moved, seconded and carried, that the Secretary be instructed to take up all outstanding notes of the Society ($500.00).

The assessment for 1911 was fixed at $3.00 per member and the subscription price to the JOURNAL was changed to $1.00 and subscription made optional.

The Council extended a vote of thanks to Senators Estudillo, Roseberry and Holohan for their efforts to protect the public health of the people of California during the last Legislature.

The Secretary presented a report on the 22nd edition of Register and Directory, showing that the book had been issued with a profit to the Society of approximately $200.00.

A number of matters connected with the general work and condition of the Society were discussed, particularly the very successful way in which the Medical Defense feature has operated, but no motions were made and no action taken.

ORIGINAL ARTICLES

FUNCTIONAL PERIODICITY IN WOMEN AND SOME OF THE MODIFYING FACTORS.

(Second Note.)

By CLELIA DUEL MOSHER, A. M., M. D., Palo Alto.

The subject of normal menstruation in women was discussed by the writer in a preliminary note published in 1901 in Vol. XII of the *Bulletin of the Johns Hopkins Hospital.*[1] As it now seems desirable to formulate some further conclusions arising from the immense mass of material which has been accumulating since 1893, and the correlation of which is still in progress, it becomes necessary to describe briefly the character of the information. The conclusions stated in the preliminary note as well as in this present one are based on two kinds of data—clinical and experimental. The first group consists of serial menstrual records of 400 women, collectively extending over more than 3350 menstrual periods. A large number of these records were made by the writer, month by month, when the women were under her personal observation from 1893 to 1896, and were then continued by the women themselves during the holidays and vacations. The records were supplemented by preliminary statements, careful intermenstrual notes, and subsequent letters. To this was added an intimate knowledge of the conditions under which the women were living and working. The second or experimental group comprises data on the respiration [2] and the blood, such as blood pressure, blood counts, hemoglobin, estimations and so on. A considerable amount of experimental work on the effect of clothing was also included.

The clinical records were begun 17 years ago, and the experimental work has been carried on as opportunity permitted in Dr. Kelly's laboratory at Baltimore; in the laboratories of Johns Hopkins and the Leland Stanford Junior Universities; and is still in progress.

The argument on which this study is based may be briefly stated as follows: Menstruation is apparently a more or less serious disability in a large number of women. One writer has described it as "a constantly recurring infirmity that occupies seven years out of thirty of a woman's adult life." It can be of no advantage to the race to have one-half of it incapaciated one week out of four. Unquestionably, therefore, relief from whatever incapacity may be associated with this physiological function is important, not only to woman as an individual, but to her as the mother of the race.

The following questions therefore arise:

1. Does the above description represent the normal or even average condition of women?

2. If not, what is normal menstruation?

3. What are the factors which modify normal menstruation?

4. What can be done to modify existing conditions?

The generally accepted view of menstruation is that it is a periodic flow of blood from the genital tract of a woman which is accompanied by varying degrees of incapacity. This idea of disability and suffering has been so thoroughly inculcated in women that one who is free from pain is almost apologetic and inclined to question whether her sense of well-being at this time is not abnormal.

The degree of suffering and incapacity described by different authorities has varied from disease to mere nervous instability. Hagewitch and Muscati called it a disease of women developed, according to the one, by civilization; according to the other, by the upright position. Tilt, after defining it as a "natural infirmity for about seven out of 30 years of reproductive life," adds that however unattended by suffering "this infirmity unfits them for any responsible effort of mind, and in many cases of body also."[3]

In Dr. Kelly's *Medical Gynecology*[4] is found a more guarded statement:

"Theoretically a woman in perfect health ought to know no difference between the menstrual and intermenstrual periods but this state of things exists only among uncivilized peoples. The effect of civilization, and more especially of the complex conditions of our modern life, has been to intensify nervous excitability to such an extent that the woman who menstruates to-day without pain or reflex disturbances of some kind is altogether exceptional."

Dr. Howell's physiology,[5] however, recognizes the possibility even among civilized women of freedom from disability. He says:

"Certain preliminary symptoms usually precede the appearance of the menses, such as pains in the back or head, or a general feeling of discomfort, although in some cases these symptoms are absent."

Without discussing further these various views, I may state a different one, which it is my purpose to discuss in the light of the data which I have obtained. I should define normal menstruation as a periodic flow of blood from the uterus of a woman, occurring at fairly definite intervals (reckoned from the first day of the onset of the flow to the first day of the next onset) in the same individual, but the intervals varying in different individuals, this function being unattended with pain or incapacity due to it as such. If we can divorce our minds from all preconceived notions in regard to this function, be they derived from individual experience, sex tradition or accepted teachings, and consider it as we do the other periodic functions, this definition will not seem unreasonable. In the first place, it must be admitted that there is no reason for treating this function differently from the other periodic functions, such as sleep, digestion, defecation and urination, which likewise have their departures from the normal. We do not find these abnormal manifestations incorporated in the definitions of them. Take sleep, for instance: however common insomnia may be, we never consider it otherwise than a departure from the normal; indigestion is only the pathological expression of an abnormal condition of the digestive function; while constipation is quite as frequent as the so-called dysmenorrheas which are associated invariably with the definitions of menstruation.

In the second place, the observers of menstrual disturbances do not by any means agree as to the numbers affected or the degree of the infirmity. Moreover, the various bodies of statistics giving the percentage of women suffering at the menstrual period have all been based on *single statements* from women examined.

Brierre de Boisment, observations on 360 Frenchwomen, 77% dysmenorrhea.

Mary Putnam Jacobi, observations on 268 women, 46% dysmenorrhea.

G. W. Englemann, observations on 4873 women, 30 to 95%.

Dr. Mary Sherwood and Dr. Lilian Welch, in their chapter on "The Hygiene of Infancy and Girlhood" make an important contribution to this question in the following paragraph:

"Englemann has tabulated 5000 cases of beginning menstruation, and finds about 60 per cent. with more or less menstrual pain. Chapman thinks that fully 75 per cent. would give a history of painful menstruation. These figures are not corroborated by a study of the menstrual history of a group of school girls under medical supervision for several years preceding and following puberty. Such a study shows that in 75% of school girls normal menstruation occurs. In a representative group from a private school only 25 per cent. reported habitual discomfort; 56 per cent. of these, or 14 per cent. of the whole, remaining away from school regularly for one or two days; 36 per cent., or 9 per cent. of the whole, had sufficient pain to go to bed for one or two days. Statistics of girls of the same grade in public schools, the girls being less likely to report slight discomfort, show still smaller percentages."[6]

If these percentages of de Boisment, Jacobi and Englemann do represent the facts, they are indeed appalling, but that they greatly exaggerate the percentage of so-called dysmenorrhea is unquestionable in view of the following facts:

1. Statistics based on single observations are necessarily inaccurate, for the following reasons:

a. The details of menstrual experience are quickly forgotten; probably more quickly by those who do not suffer than by those who do.

b. When asked what their usual condition is, many women reply by describing the most recent

menstrual period, and forget the variations incident to previous periods.

c. It is more difficult to obtain records from well women than from those who suffer, because their condition, being normal, makes slight impression upon the mind; consequently the available data inevitably exaggerate the number of women who suffer.

d. Gynecological records are always available, and many of our statistical records are made up from the same sources. They certainly do not represent accurately the experience of average women, even when they are the patients' statements as to their condition before the illness which took them to the gynecologist. Not only is the present time of suffering bound to color their statements, but the importance of giving emphasis to every symptom they have ever had is unduly prominent in their minds. Under such circumstances, the occasional pain or discomfort becomes the habitual condition.

e. Increased discomfort may occur from cold and exposure in the winter season; therefore single observations made in inclement weather would increase unduly the proportion with painful menstruation.

f. The greater part of the observations on which the current view of menstruation is based were made by men and are therefore less accurate than those made by women, for the simple reason that women will speak more freely to one of their own sex than to a man, even though he is a physician.

The inaccuracy of general statements is well illustrated by certain tests which I have made on this point in collecting my own statistics. One hundred and eight women were asked to give their opinion as to their average menstrual cycle or the range within which it varied. When this statement was compared with the serial monthly record of each, it appeared that not one had given the correct average cycle and only sixteen gave it within one day. Of those who gave the limits within which the menstrual cycle varied, none gave them correctly.

If such contradictions can occur between single observations and continuous records in the case of women who were making an effort to tell the precise truth, it is reasonable to suppose that the statistics quoted, which set down 30 to 95 per cent. of all women as having some dysmenorrhea and which are based on single statements, must vary widely from the truth, if indeed they do not grossly exaggerate the amount of suffering.

2. Is all of the so-called dysmenorrhea true dysmenorrhea? Let us clear up the subject by dividing all dysmenorrhea into two classes: (a) those cases due to organic trouble of the generative organs, which belong to the gynecologist, not to the physiologist; (b) cases of functional dysmenorrhea. The functional dysmenorrheas must be again subdivided into (1) the true functional dysmenorrheas, and (2) coincident functional disturbances occurring in other organs at or near the menstrual period, but in no way due to the menstrual function as such.

In order to make more clear what I mean, I must refer to certain experiments in blood pressure which I made in 1901. At that time I called attention to the rhythmical fall in blood pressure, at definite intervals, which occurs in men as well as women; and which is, therefore, not a menstrual rhythm.

A curve constructed on the subjective observations of the sense of well-being, shows ups and downs corresponding to the marked variations in blood pressure; the sense of maximum efficiency of the individual corresponding to the time when the pressure is high, and of lessened efficiency to the periods of low pressure. The observations were carried on independently of each other. The subjects whose daily blood pressure were being made by the writer, kept a separate record at the same time of all their sensations which had to do with the feeling of well- or ill-being. This personal data I did not see till after I had plotted the blood-pressure curves. In no case was the change in efficiency sufficient to incapacitate the individual.

In both sexes the time of low pressure appears to be a period of increased susceptibility. If symptoms of any kind are shown they are apt to be given by the point of least resistance. For example, in a man or woman having a tendency to digestive disturbances, the symptoms from the digestive tract are likely to occur at the period of low blood pressure; or when a slight chronic catarrh exists, as so frequently happens in this climate, there may be marked increase of symptoms from the respiratory tract.

When the rhythmical fall in blood pressure in women occurs at or near the menstrual period, the associated depressions, digestive disturbances, catarrhal symptoms, etc., which may occur at the period of low blood pressure, are usually referred to the menstrual function.

The point of lowest pressure is not, necessarily, coincident with the onset of menstruation, but varies in relation to it in different individuals. In Case I, when the blood pressure observations were carried over two periods, the lowest occurred on the last (6th) day of the menstrual period, in one month, while in the next month it occurred on the fourth day of the menstrual flow, which lasted seven days. These variations would not only serve to emphasize the fact that this drop in blood pressure is not a menstrual rhythm, but they also indicate that it is a mistake in the particular case of coincident slight digestive disturbance, i. e., Case I, to refer it to the menstrual condition as a cause.

The variations in two other cases were as follows: Case II the lowest pressure occurred on the first day of the menstrual flow, and in Case V it occurred on the eighth and last day of one period, and at the next on the first day of the menstrual flow.

One young woman with whom I discussed this matter stated that great mental depression was the only symptom she ever had, but on further questioning she admitted that she had noticed that the depression sometimes came before the flow and sometimes during the flow, but had nevertheless attributed it to menstrual disturbances. In such a case it would be more reasonable to attribute the depression to the fall in blood pressure than to menstruation, or the symptoms in this case might be due to a functional disturbance in the nervous system at or near the time of menstruation.

I am convinced that many of the so-called dys-

menorrheas are not dysmenorrhea at all, but coincident functional disturbances in other organs.[7] It is highly suggestive that the symptoms coincident with low blood pressure usually are slight, in busy, active women, as in men.

When the attention is of necessity directed to so obvious a process as the menstrual flow, untrained women, especially if without absorbing occupation, naturally refer their lessened sense of well-being and diminished sense of efficiency, which may accompany the lowered general blood pressure occurring near or at the menstrual flow, to the function of menstruation.

To sum up: The percentage of women suffering at the menstrual periods as given in the various statistics published, greatly exaggerated the facts, first, because the data are based on single observations; and second, because among the functional dysmenorrheas are included all the coincident functional disturbances in other organs due to lowered general blood pressure, the blood pressure having a rhythm of its own, independent of the menstrual rhythm.

But if my contention be granted, the fact remains that too many women are periodically incapacitated.

Of the factors at work producing the dysmenorrheas (and producing also the exaggerated emphasis upon associated disturbances which are usually included among the dysmenorrheas) the following are most prominent:

I. Psychical Influences: The attention of girls is directed of necessity, but often unduly, to so obvious a function as the menstrual flow. From the moment a girl hears of it, she is taught to regard it as a periodic illness. The terms "sick time," "being unwell" have long been grafted into our ordinary speech. Frequently the terms "monthly period" or "menstruation" are not understood by the ordinary woman. The effect upon the mind of constantly anticipated misery can scarcely be measured. Imagine what would be the effect on the function of digestion if every child were taught to refer to it as a sick time! After each meal every sensation would be exaggerated and nervous dread would presently result in a real condition of nervous indigestion, a functional disturbance. Or again, imagine the effect upon the periodic evacuation of the bowels if every boy and girl were taught that constipation was practically inevitable for every person. Would there not be an inhibition of the normal peristalsis and a resultant imperfect functioning? It is said that it is possible to make a man ill by simply having a number of people tell him how ill he looks. Certainly there is no disputing the fact that the mind has a powerful, if unconscious, control of organic processes. For generations, if we have taught girls anything at all in regard to menstruation, we have been instilling the idea that it is a periodic illness involving suffering and incapacity. Surely this is a very potent factor in the emphasis and exaggeration of every sensation at this time. From girlhood to middle age women are brought up in anticipation of misery, for even the cessation of menstruation, the menopause, is regarded with apprehension. Ask any woman how she feels about the coming change of life, and she will invariably tell you she looks forward to it with dread, expecting to be incapacitated or perhaps insane. Thus her own nervous anticipations tend to increase whatever incapacity she may have to suffer. While it is true that a certain number of women are incapacitated at this time; that it is a period of profound changes in the generative organs, and a period when malignant disease is more frequent, yet I do not hesitate to affirm that much of the incapacity of this period is unnecessary and avoidable. There is no occasion for a woman to dread this period unduly. Much of the trouble is due,

1st, to a nervous letting go of the woman's self-control; an acceptance of the "inevitable incapacity." Instead of morbid unhappiness, the climacteric should produce in the mind of a healthy woman no more than a mild regret that the period of youth and potential motherhood is over, and should be naturally welcomed as release from the inconvenience attendant upon menstruation.

2nd. Nervous symptoms in women at the menopause are due as much to social and family changes as to physical causes. If the woman has been the mother of a family, her family has grown up, her period of financial stress and effort in helping to build up the family fortunes is over. If she has had intellectual interests earlier in life, she has dropped them. She is confronted with a loss of her usual occupations and an absence of all necessity to exert herself; and at the same time her attention is directed unduly to her physical discomforts, be they small or great, or be they only a mere physical consciousness of altering conditions. Her condition is almost exactly analogous to that of an active man who stops business in middle life. Such a man nearly always develops neurasthenic symptoms. Why should we be surprised when a woman does the same, with even greater reason? Without absorbing occupation, without mental diversion, and encouraged by the sympathetic pity of her friends, she lets herself go to pieces nervously, and spends a period of years wearing out her family and finding life not worth living.

In a recent article, Church has called attention to the nervous and mental disturbances of the male climacteric.[8] This has added proof that the blood-pressure rhythm is a periodic variation, not necessarily coincident with the menstrual flow. Although the disturbances at the menopause are in part at least due to the same causes as the other changes which take place at that period of life in both sexes, the cessation of the monthly flow does not necessarily account for all that may happen at this period. For this reason it might be desirable to limit the term "menopause" to the cessation of the menstrual flow in women, and to use the broader term "climacteric" for the manifestations of the changes at the end of the sexual life in both men and women.

Setting aside the women who have organic disease, what classes escape the disturbances of the menopause and climacteric? The answer may be given without fear of contradiction: those who are busy and useful. The women who have absorbing occupations, who are vitally necessary in the world, are the ones who get through this period unharmed. A prominent woman physician in the East declared a few years ago that not a single woman physician

of her acquaintance had gone to pieces at the change of life. Among a considerable number of women who are teachers or authors or (in some cases) have carried the burden of the mother of a family while occupying a salaried position throughout the menopause, not one has had to quit work for this cause and two have certified that the research work which has brought them distinction was done during the years of this functional change without any inconvenience whatever.

If all women were examined after 40 years of age to make sure that no insidious malignant growth is at work; if all thought of the menopause were then dismissed from the woman's mind; if her work or her care were lightened merely and she were provided with absorbing occupation which did not make excessive demands upon her strength, nine out of every ten women would go through the menopause without the world knowing that the time had even arrived.

Having pointed out briefly the psychical and the social causes for the dread of the menopause in women's lives, I may return to the discussion of the menstrual habits which lay the foundation for them. The effect of a mere attitude of mind upon this function may be illustrated by the experience of Miss X, who had developed a habit, when she was about nineteen years old, of vomiting the food she ate on the first day of menstruation. The habit seems to have been induced by severe attacks of indigestion which originally may have happened occasionally at or near the monthly period. Because of it she had practiced fasting on the first day of menstruation for about five years. About this time a man living in the same boarding-house commented to his wife on Miss X's periodic abstention from food. The wife repeated this comment to Miss X herself, who thereupon determined to eat her food every day "even if it killed her." She never vomited again, and is to-day a perfectly well woman with no periodic symptoms of any kind.

Believing that a universal crusade against the terms "sick time" or "being unwell" to designate the menstrual period would lessen the number of women with spurious dysmenorrheas, I have banished them in all my work with women. The psychical effect of such terms cannot readily be measured, for in truth the whole physical life of women has come to be expressed in terms of menstruation. Until we can treat this periodic flow of blood from the uterus as an incident rather than the central idea of life, the morbid apprehensions will continue to exert a malign influence and the general disabilities and neurasthenic condition of women will be thereby increased.

Certain physical factors constitute a second class of influences which are at work to bring about physical degeneration, and to multiply the number of women suffering from dysmenorrhea. The most important of these are: (1) Alteration of the normal type of respiration due to unsuitable clothing; (2) lack of muscular development; (3) incorrect posture; (4) chronic constipation. These may be discussed seriatim:

(To be concluded in February issue.)

A FEW NOTES ON THE NEW REMEDY FOR SYPHILIS, "EHRLICH, 606."*

By DOUGLASS W. MONTGOMERY, M. D., San Francisco.

While in Buenos Aires on a trip through South America, Dr. Balmano Sommer told me the news of a remedy recently discovered by Ehrlich of Frankfurt, that was said to be so startlingly effective as to constitute a revolution in the practice of medicine. I set out immediately for Europe. On arriving in Paris, through the kindness of Dr. Hallopeau, I became acquainted with Dr. Milian, who was using the new drug on the patients in the St. Louis Hospital. Dr. Milian is an excellent observer, and most genial in his presentation of facts; and the new remedy for syphilis could not have been put in better hands.

There is no doubt "606" has a marvelous effect on active syphilitic lesions, whether primary, secondary, tertiary or hereditary. What action it will have on such manifestations of syphilis as tabes and paresis can only be determined after long observation. Nor can the effect of the remedy in preventing the occurrence of these grave diseases of the nervous system yet be decided. Ehrlich has recently given it as his opinion that "606" should not be used either in tabes or in advanced paresis.[1] Dr. Milian showed one case that seemed to indicate that some effect had been produced. A young man was just recovering from a gastric crisis, when a dose of arseno-benzol was given him. He immediately had another crisis, and a severe one. When he recovered from that, he looked like a chastened spirit. What the ultimate effect in this case will be, whether beneficial, or detrimental, or indifferent, will be a matter for further observation.

According to the first reports this remedy seemed strangely free from evil or disagreeable results, for, after all, the drug contains arsenic. Furthermore, in therapeutics, the axiom is almost constantly true, that a drug that is powerful for good, is also powerful for evil. Even quinin has often disagreeable or dangerous effects. Up to the present the only disagreeable results I have seen from "606" are pain, redness and doughy swelling at the point of injection, and some rise in temperature. It is said that in a number of cases necrosis has occurred after the fourteenth day at the point of injection. I have seen nothing like this in the cases here. In discussing this point, Dr. L. Brocq remarked that twenty years ago, when the mercurial salts were injected into the subcutaneous tissues between the shoulder blades, where the "606" is now usually injected, they were also followed, at times, by severe ulcerations. This resulted in the mercury being injected into the buttocks.

I have not yet seen any fatalities from arseno-benzol, but it is freely rumored there are now fourteen cases of death from its use, and that one of

* Written specially for the State Journal.

1 Wiener Med. Wochenschrift. No. 36, Jahrgang 1910.